

Environmental Assessment  
**Stream and Trail Restoration on Coal Creek**  
**Using Stream Bank Revetment and Diversion**  
Yukon-Charley Rivers National Preserve

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## 1.0 PURPOSE AND NEED FOR ACTION

### 1.1 Purpose and Need for Action

The National Park Service (NPS) is considering a construction project in order to divert the entire flow of lower Coal Creek into the eastern (or natural) channel at a bend approximately 0.7 miles above the confluence with the Yukon River in Yukon-Charley Rivers National Preserve. Bank revetment structures using local natural materials and gabion baskets would divert stream flow. The objective is to prevent water from continuing to flow into and erode the lower caterpillar tractor (cat) trail which was used for mining access from the 1960s to 1985 and NPS administrative access since 1986. In addition, the diversion would restore natural fluctuations in flow and bed degradation of the natural channel restoring a more sustainable gradient, aquatic habitat and floodplain function on the lower reach. Construction would occur during fall low water conditions. The complete proposed action and alternatives are described in chapter 2.

Summer administrative functions necessitate regular transportation of fuel, building materials, equipment, and personnel to and from the Yukon River and Coal Creek Camp within the Coal Creek Historic Mining District. Non-motorized public recreational access to the historic dredge and camp, as well as numerous associated sites of cultural interest, is increasing.

The purpose of the project is to provide a trail for NPS administrative vehicular access and for visitor foot access between the Yukon River and Coal Creek Camp. Despite increasing visitor use and management

activities, there has never been a reliable, safe or cost-effective means of public foot access or administrative access for motor vehicles between the river and camp within this National Historic District. Options for summer transport of NPS personnel, equipment and supplies between the river, camp and airstrip include flying in, walking, or driving an Off Road Vehicle (OHV) on the lower trail. The upper trail is not passable in the summer for any type of motorized vehicles due to the poorly drained soils and resource damage that would occur with vehicular use.

For the first half mile traveling south from Slaven's Roadhouse the trail and the western or human-modified channel converge several times. Rising water levels and increased velocity often makes use of this section of the trail impassable, especially from breakup in mid-May to early summer, during drainage thunderstorms and with increased August rains. Approximately 25-50% of the stream flow at moderate or high water levels now flows into the caterpillar tractor trail pioneered along the creek in the 1950s and upgraded more extensively in the 1960s (Beckstead, pers.comm). The next mile long stretch of the trail to just above the dredge is well to the west of the creek channels and generally unaffected by creek discharge. Approximately 500 yards above the dredge the trail crosses braided channels twice where temporary wood structures are used to bridge the creek. For the past several years these bridges are put in place after spring break up and removed in the late fall. From that area to the airstrip, the cat trail is built upon elevated dredge tailings and is not affected by the creek. In 2001, for reasons of safety and resource protection, the superintendent limited NPS vehicular use of the cat trail when water is flowing in it, which in a normal year is most of the summer.

This environmental assessment (EA) analyzes the proposed action and alternatives and their impacts on the environment. The EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9).

## 1.2 Background

### Park Purpose and Significance

Yukon-Charley Rivers National Preserve is to be managed for the following purposes, among others: "to maintain the environmental integrity of the entire Charley River basin, including streams, lakes and other natural features, in its undeveloped natural condition for public benefit and scientific study; to protect habitat for, and populations of, fish and wildlife, raptorial birds, caribou, moose, Dall Sheep, grizzly bears, and wolves; and in a manner consistent with the foregoing, to protect and interpret historic sites and events associated with the gold rush on the Yukon River and the geological and paleontological history and cultural prehistory of the area...."

The primary significance of the preserve can be summarized as follows:

- a world significant assemblage of diverse geological and paleontological resources that are unusually complete and provide at least a 600 million year record stretching back to the close of the Precambrian .
- the area between the Nation, Kandik and Yukon Rivers is postulated to be a portion of the North American plate which has escaped deformation from geological forces to remain as an incredibly intact geological and paleontological record. Some of the oldest known microfossils in existence have been found in this area.
- the entire Charley River watershed protected in its undeveloped natural condition.
- high quality habitat supports one of the highest density nesting populations of American Peregrine Falcons in the United States.
- portions of the Han and Kutchin Athapaskan traditional homelands.

- sites preserving activities and events of regional significance associated with the gold rush era are present and exemplified by bucket dredges, mail trails, trapper's cabins, boats, roadhouses, water ditches and machinery.
- large areas that may represent an unglaciated refugium for endemic floral and faunal communities.

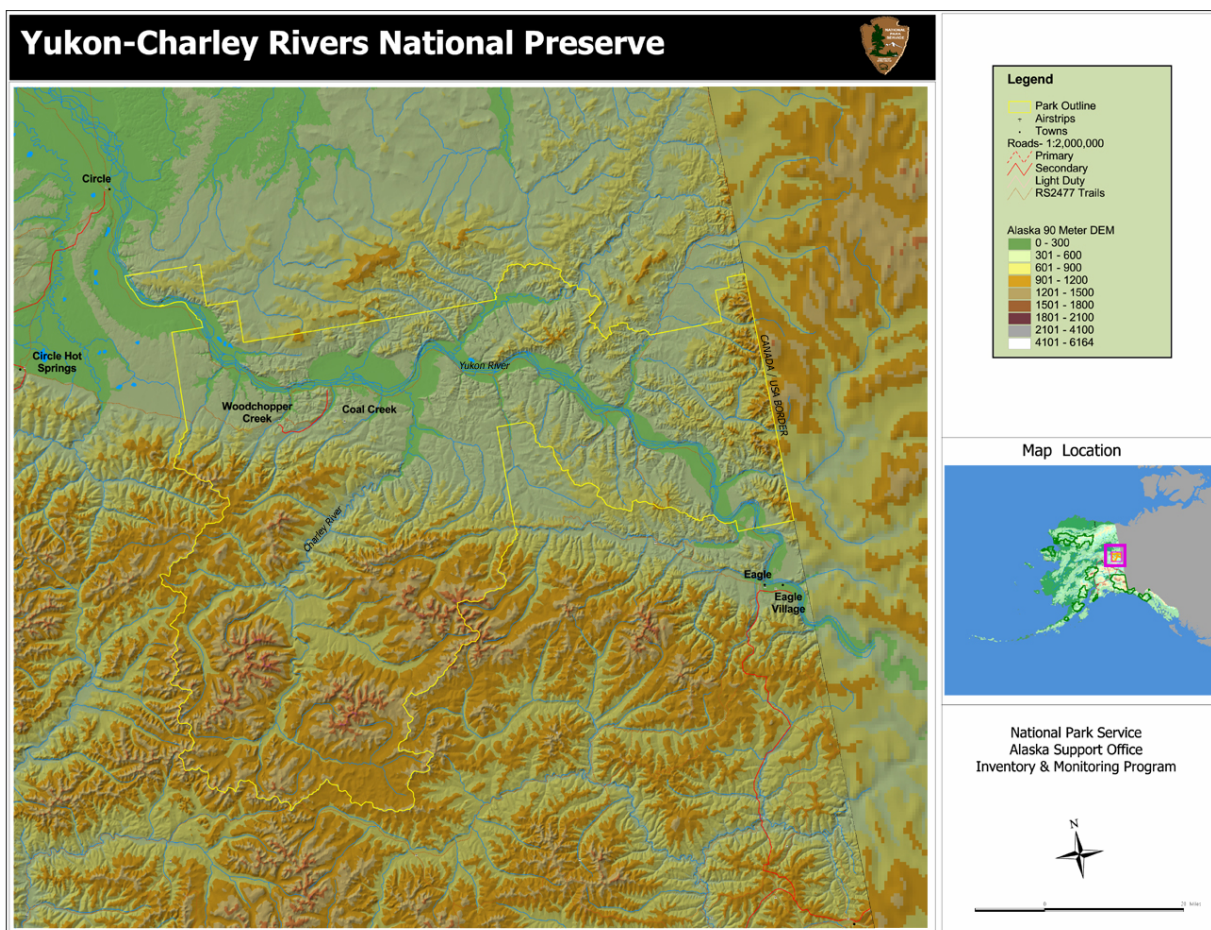


Figure 1.2.1: Preserve Location Map

### Laws, Regulations and Policies

The NPS Organic Act and the General Authorities Act prohibit impairment of park resources and values. The 2001 NPS Management Policies uses the terms “resources and values” to mean the full spectrum of tangible and intangible attributes for which the park is established and managed, including the Organic Act’s fundamental purpose and any additional purposes as stated in the park’s establishing legislation. The impairment of park resources and values may not be allowed unless directly and specifically provided by statute. The primary responsibility of the NPS is to ensure that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The evaluation of whether impacts of a proposed action would lead to an impairment of park resources and values is included in this environmental assessment. Impairment is more likely when there are potential impacts to a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or;

-identified as a goal in the park's general management plan or other relevant NPS planning documents.

The 1985 General Management Plan (GMP) did not directly address administrative use of Coal Creek facilities or access between the camp and river because the placer claims were actively mined at the time the plan was written. However, the GMP anticipated the need for seasonal visitor contact and duty stations as well as summer employee housing (GMP, page 67). The mining camp was still used by placer miners as it had been for decades and the roadhouse, dredge and thousands of items of cultural resource interest were located on active unpatented claims. All of the consolidated unpatented placer claims in the valley, except for the small claims on the tributary of Boulder Creek (approximately 4 miles above the project site), were donated to the government in 1986. The Boulder Creek claimants are allowed OHV access on the cat trail under a Special Use Permit for annual assessment purposes. No placer mining activities occur there.

In the early 1990s in response to budgetary concerns, continuing local controversy and the need for permanent facilities to accommodate preserve users and staff, a Development Concept Plan/Environmental Assessment (DCP) was developed to re-evaluate options for management and administrative functions between Eagle and Fairbanks. In a cost-saving move, Fairbanks (and consolidation with Gates of the Arctic NP & P under one superintendent) was selected, recognizing that Coal Creek could be developed to accommodate more use as a base of summer operations and reduce impacts on the community of Eagle. The worked portion of the old claim area was listed on the National Register of Historic Places in May, 1995 and the Coal Creek Historic Mining District is one of the four identified Cultural Landscapes identified in the preserve (Cultural Landscapes Inventory, 2002).

Stewardship responsibilities under the National Historic Preservation Act give the NPS authority to proceed with the preservation of the resources within the Historic District. Under these documents and authorities, the NPS has accomplished many projects fostering the preservation and administrative use of the Coal Creek area. This direction was made explicit in the 1987 Coal Creek Mining Camp Historic District Guide for Management that recommended stabilization/ rehabilitation of the roadhouse and camp buildings for adaptive use for interpretation and park administrative uses.

In March of 2002 an environmental assessment for improving access from the river to the camp was begun in response to the administrative decision to prohibit administrative motorized use of the lower road where the creek intersects it. That draft document focused on improving the upper trail and identified issues through scoping and engineering feasibility assessments but was never completed for review. This EA builds upon that experience and addresses the same access options, as well as the restoration of lower Coal Creek, and supercedes that uncompleted assessment.

### The Project Setting

The Coal Creek drainage, 110 miles downstream from Eagle, exhibits extensive stream and riparian area disturbance associated with decades of placer gold mining activities. These past placer mining activities range from hand mining begun in 1905 to industrial gold dredge operations from 1936-1977 and succeeding heavy equipment sluice-box operations until 1986. When the preserve was established in 1980 there were 85 unpatented claims encompassing 4,555 acres within the watershed. Approximately 769 acres have been affected by mining-associated activities. Most of this acreage remains as barren or partially re-vegetated tailings along the main stream channel from Colorado Creek downstream to Pendergast Creek (approximately 5 miles).

The historic camp buildings at Beaton Pup, Slaven's Roadhouse on the Yukon River and the dredge and associated cultural resources have naturally become focal points for visitor use and NPS administrative activities. The Coal Creek Historic Mining District encompasses 350 acres (including the project site) extending from Slaven's Roadhouse on the Yukon River up drainage to Colorado Creek.

Numerous projects have been undertaken since that time to improve the area to meet basic NPS standards for resource management and public health and safety. These activities have included inventories of cultural resources, sampling and removal of hazardous wastes and contaminated materials, stabilization and repair of historic structures, research on natural resources, conducting science education camps, providing adequate power and water to the camp, and improving the airstrip and summer trail access to the Yukon River in the lower portion of the drainage. Over the years many structures in the Coal Creek Historic District have been stabilized or rehabilitated.



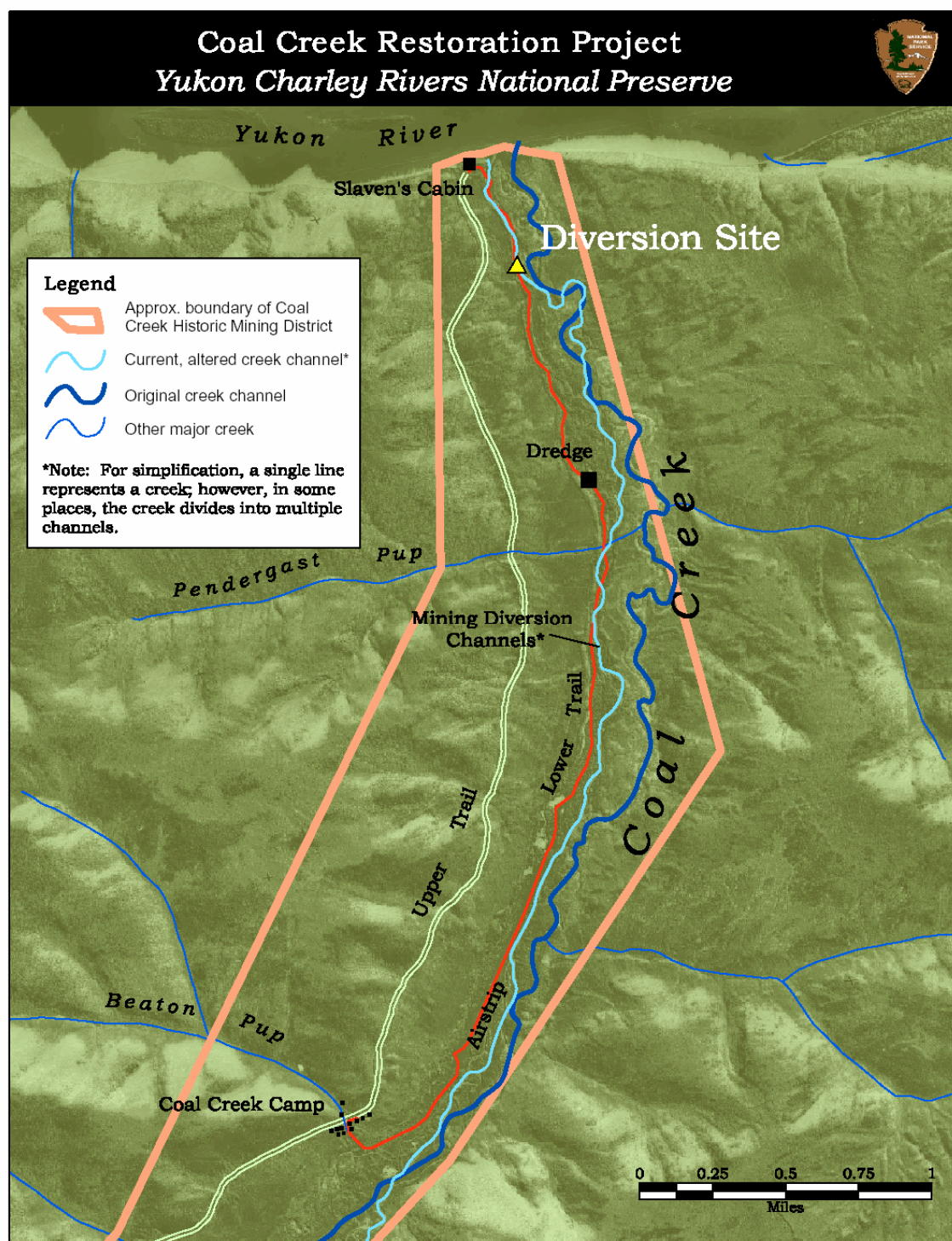


Figure 1.2.2: Project Location Map

### 1.3 Issues

To focus the environmental assessment, the NPS selected specific issues for further analysis and eliminated others from evaluation. A brief rationale is provided for each issue that is analyzed in the environmental consequences section.

Issues to be considered in impact analysis were identified through preserve interdisciplinary team scoping and consultation with the State Historic Preservation Officer, Alaska Department of Natural Resources Division of Habitat and Permitting, U S Fish and Wildlife Service (Endangered Species), civil engineers and the Army Corps of Engineers (Fairbanks). Potential impact topics identified included: water quality, wetlands, floodplain, vegetation, non-anadromous fish species, aquatic resources, visitor use and recreation, cultural landscape values, historic structures, park management activities, subsistence activities, stream hydrology and visual intrusion of the revetment structure itself.

#### 1.3.1 Issues Selected for Detailed Analysis

##### Water Quality

-stream bank/channel construction of the revetment would temporarily impact water quality; heavy equipment could decrease water quality during intermittent in-stream equipment operations to re-channel the stream and material discharge as the gabions are placed.

##### Wetlands

-heavy equipment operation would impact some areas of riparian vegetation and willow-birch shrub growth on the stream bank and channel margin that has naturally regenerated since mining and transportation-related operations stopped. Riparian and adjacent wetland areas downstream could be enhanced or impacted by diverting stream flow back into the eastern channel.

##### Floodplains

-this diversion could result in more functional and natural stream hydrology and floodplain function associated with the eastern stream channel down to the confluence with the Yukon River.

##### Vegetation

-some riparian vegetation along the revetment bank may be crushed or buried by equipment movement, gabion placement or bank sloping  
-gabions above mean high water structures, as well as the sloped bank will be planted with local willow cuttings and netting to control erosion

##### Fisheries

-discharge of gravel into the stream channel, equipment use and diversion of the main stream flow back into the eastern channel could impact fish habitat and fish populations.

##### Visitor Use and Recreation

-project construction and hauling activities over 2-3 weeks would cause temporary impacts to visitor use, visitor safety and accessibility.  
-there could be some degradation of visitor experience in the Historic District as a result of visual and noise intrusion during construction where the stream and lower trail converge between the dredge and river.

### Park Management

-restoration of the lower cat trail and diversion of the creek would improve administrative access and allow for safe and reliable public use of the lower trail connecting sites of historic interest.

### 1.3.2 Issues Dismissed from Detailed Analysis

### Cultural Resources

The project site is within the Coal Creek Historic Mining District boundaries. The site would cover approximately 1/10<sup>th</sup> of an acre as a curvilinear revetment structure approximately 270 feet long and 12 feet wide on an eroding bend. The creek channel over nearly 1,000 acres has been repeatedly manipulated by mining activities for decades and is not considered a “constructed feature”. The creek flow was repeatedly moved from place to place to facilitate removing the muck layer and thawing frozen gravels in anticipation of dredging operations. Latter heavy equipment operations set up sluice box operations requiring large volumes of moving water in seeking gold that the dredge missed. The dune-like tailings piles left by the farthest downstream operations of the bucket dredge, as identified in the List of Classified Structures (LCS), are important constructed cultural features and are hundreds of meters above the project site.

A large number of historic buildings and artifacts are dispersed within the lower drainage. However, there are no known historic buildings, structures, object or site at the proposed diversion structure site, nor any within the floodplain downstream that might be impacted by diverting the creek flow entirely into the eastern (or natural) channel. Slaven’s Roadhouse is a rehabilitated historic building on the Yukon River 200 meters below the confluence of Coal Creek and approximately 10 meters above mean high water and would not be affected by this diversion project. This project undertaking and location were originally assessed with SHPO consultation in 1998. The project was never carried out due to a lack of funds and personnel. The main proposed gravel borrow area above the camp have been assessed and received SHPO concurrence in 2001. Other sources along the margins of the airstrip where extensive grading occurred during construction and are being assessed and consultation with the SHPO has been initiated. If the SHPO fails to concur that the use of these borrow areas would have no adverse effect on the characteristics that made the District eligible for the National Register of Historic Places, borrow materials would be confined to the previously identified and cleared areas.

Since the soils were washed away in stripping operations several decades ago, there is no likelihood of archeological resources in situ at the revetment site (see Appendix B: Summary of NHPA Section 106 XXX Assessments of Actions YUCH-98-002 and YUCH-01-007).

### Subsistence Uses

This area is rarely used for subsistence activities and possible impacts on subsistence users and subsistence resources from the proposed action are considered negligible. (see ANILCA Section 810 analysis in Appendix A)

### Threatened and Endangered Species

The Endangered Species Act requires and analysis of impacts on all federally listed threatened and endangered species, as well as species of special concern. In compliance with Section 7 of the Act, the US Fish and Wildlife Service (USFWS) has been consulted. No federally designated threatened or endangered species are known to occur within Yukon-Charley Rivers National Preserve (pers. comm. with Ted Swem, USFWS, Fairbanks, Alaska April 10, 2004) and none are anticipated to be affected by this project.

### Visual Intrusion

The revetment site is screened by natural vegetation from the cat trail, would be constructed of local cobble and gravel and would be planted with local willow cuttings to blend in with the riparian and dredge tailing landscape features. Visual intrusion would be negligible.

### Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, requires all federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. This project is not expected to result in significant changes in the socioeconomic environment of the area, and therefore is expected to have no direct or indirect impacts to minority or low-income populations and communities.

### Wilderness Character

The Coal Creek, Woodchopper and Sam Creek drainages were studied and found to be not eligible for inclusion in any future wilderness proposals in a 1988 report and EIS. No decision document was signed for this EIS.

## 1.4 Permits and Approvals Needed to Implement Project

Table 1.4 provides a list of environmental permits and reviews required for this project. A Corps of Engineers Clean Water Act 404 Permit is required for any part of a project that traverses the waters of the United States, including wetlands or involves the discharge of materials into waterways. Also where any road crosses a water body with fish resources or development activities might impact fish resources, the Alaska Department of Natural Resources Division of Habitat and Permitting requires a Fish Habitat Permit.

<b>Regulated Activity (Required Permit/ Approval)</b>	<b>Regulatory Agency</b>	<b>Authority</b>	<b>Description</b>
Discharge of dredged or fill materials in U.S. waters, including wetlands (USACE Fill Permit)	USACE/ EPA	Section 404, Federal Water Pollution Control Act of 1972, as amended by the 1977 Clean Water Act	The Corps of Engineers must authorize the discharge of fill materials in U.S. waters, including some wetlands.
Development possibly affecting historical or archeological sites (Cultural Resource Concurrence)	Office of History and Archeology/ State Historic Preservation Office	Section 106, National Historic Preservation Act of 1966	For any federally permitted, licensed or funded project, the SHPO must concur that cultural resources would not be adversely impacted, or that proper methods would be used to minimize or mitigate impacts.
Obstruction of Fish Movement and Passage ( Fish Habitat Permit)	Dept. of Natural Resources Office of Habitat Mgt and Permitting	Alaska Statute 41.14.840	DNR Habitat must review the scope of work to ensure adequate fish movement and passage during in-stream activities.
Occupancy and modifications of floodplains (NPS Floodplain Management Guidelines-Statement of Findings)	NPS/All federal agencies	Executive Order 11988 (Floodplain Management 1977)	NPS and all agencies must avoid to the extent possible adverse impacts associated with occupancy and modifications of floodplains, including direct or indirect support of floodplain development, whenever there is a practicable alternative.
Destruction or modification of wetlands (NPS Wetlands Protection Guidelines-Statement of Findings)	NPS/ All federal agencies	Executive Order 11990 (Protection of Wetlands) 1977	Same as above description

Table 1.4: Environmental Permits and Reviews

## 2.0 Alternatives

### 2.1 Introduction

This section will describe and compare a range of reasonable alternatives, including the proposed action alternative and a no-action alternative. These alternatives were formed based upon preserve interdisciplinary team discussions, management strategies and policy direction. Tables 2.1 and 2.2 at the end of this section compare the alternatives in terms of actions taken and their environmental impacts.

### 2.2 Alternative A: No Action

Under this alternative, no restoration of the lower creek channel and cat trail using bank revetment diversion would occur. The upper road would remain impassable to motorized equipment except when the ground is frozen and adequate snow cover exists in winter months. Due to the uncertainty as to how much water would flow in the cat trail, use of the lower trail would be seriously restricted. General access would continue to be limited to foot or air access between the river, dredge and camp in the summer months. Supplies for structural maintenance and repairs on the dredge would continue to be flown in to the airstrip for transport. Visitors would continue to be able to walk along the stream and use rudimentary bypass trails to the dredge but would be limited by moderate and high water events. (See section 3.0, Affected Environment, for additional details about the current situation.) This alternative

represents a continuation of the existing situation and provides a baseline for evaluating the changes and impacts of the action alternatives.

### 2.3 Alternative B: Restore Lower Creek Channel and Cat Trail by Diverting Flow Back into the Natural Eastern Channel (Preferred Alternative) (Environmentally Preferred Alternative)

This alternative involves the construction of a bank revetment on the west bank of Coal Creek approximately 3,700 feet upstream from the confluence with the Yukon River. This gabion basket structure would divert the creek flow to the east into the natural meandering channel and prevent increased flow and degradation of the overflow channel that has cut the bank and entered the cat trail leading to the river.

The bank revetment structure would be approximately 270 feet in length along the left bank of the creek beginning about 90 feet above the cutoff channel. The upper and lower end of the structure would be tied in with 6 foot sections of stacked baskets. The structure consists of a gabion basket base placed in a shallow excavation in the stream channel to protect against toe scour with gabion mattresses resting on them and sloped to protect the upper bank from erosion.

The base of the gabion structure would be a 3 foot by 3 foot sequence of baskets placed in a minimum 3 foot deep trench excavated along the left edge of the stream channel. The excavated materials (approximately 90 cu. yds.) would be used to fill baskets and back the mattresses.

The baskets and mattresses would be filled with local gravel and cobble grading from 4" to 12" with less than 10% fine materials (Karle, July 2004). This would require approximately 165 cubic yards of fill. Willow species cuttings from the site will be used to plant the bank mattresses. Various gravel and cobble materials would be hauled from borrow sites already identified and cleared by preserve cultural resource specialists above the camp and along certain margins of the gravel airstrip (see Appendix B). The materials would be stockpiled outside of the floodplain on the trail or previously disturbed areas. Large woody materials would not be used in any part of the construction. The limited soils removed would be stockpiled and used on gabions for willow re-vegetation.

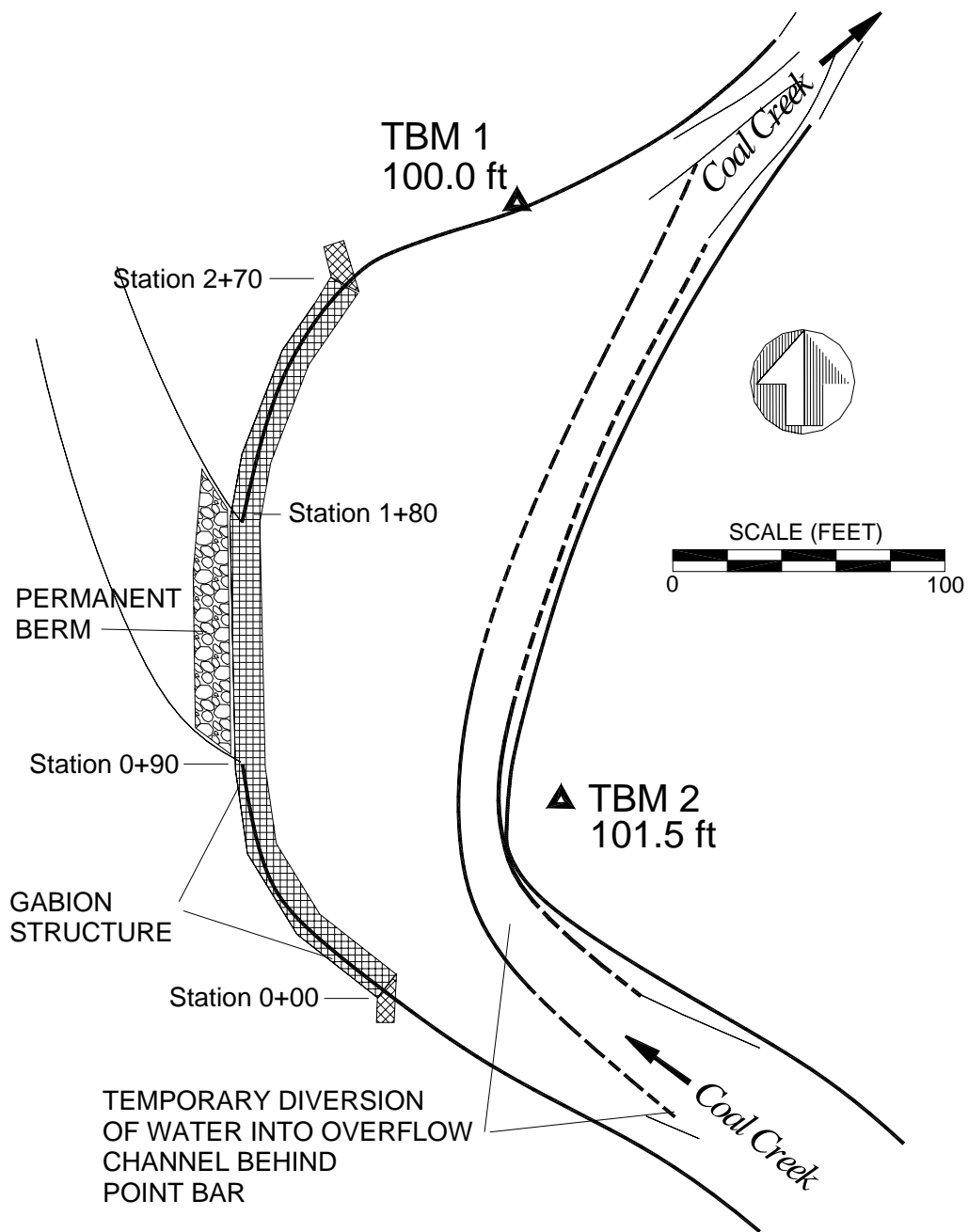


Figure 2.3.1: Proposed Bank Revetment Structure

A gravel berm would be required to back the revetment along the mouth of the degraded overflow channel. This berm would be about 6 feet high, over 90 feet in length and about 12 feet wide at the base (estimated 240 cu. yds.). Gravel in the cat trail/channel bed would be pushed up to form the berm (Karle, July 2004).

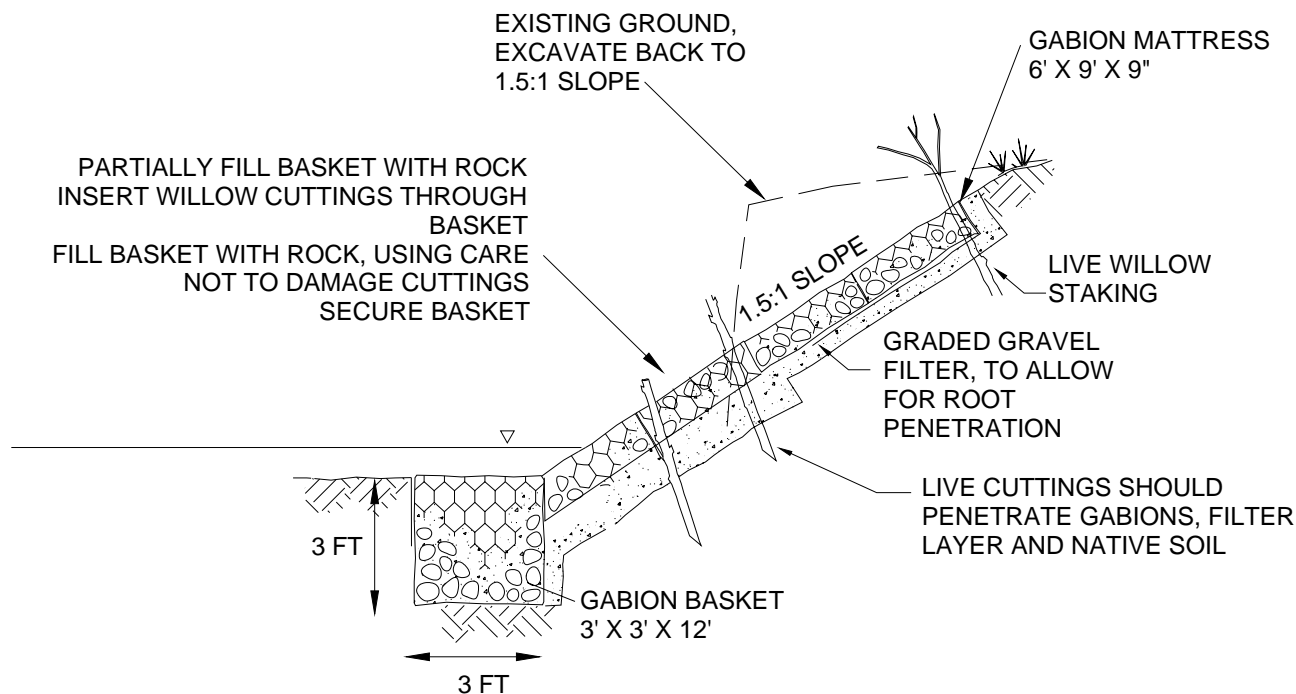


Figure 2.3.2: Revetment Structure Cross Section

A D-3 caterpillar tractor (with backhoe attachment), 3 yard dump truck, a Bobcat on tracks with attachments, and rock sorter would be the extent of the heavy equipment used in construction.

Once the stream flow has been successfully diverted back into the natural channel the cat trail would be smoothed and surfaced on existing gravel to make it reasonably passable for OHVs and light trucks below the structure. Gravel that has been exposed or deposited in the roadbed channel by high water events would be used for this purpose.

#### Mitigation Measures

The project would be undertaken in late summer or early fall in order to reduce impacts in the following ways: lessen the impact of construction noise and activities to the visiting public (visitation peaks in July), reduce the potential to impact fish rearing habitat downstream of the site, minimize visual intrusion to the visiting public, and avoid nesting/birthing timing for most avian and mammal species inhabiting the riparian area along the stream.

Turbidity and sediment load would be minimized as gravel and cobble used for gabions is generally nearly devoid of fine materials and soil (estimated to be less than 10%) as it would be taken from flattened and reworked tailings in the vicinity.

Work crews would use the mining camp for lodging and facilities and not further impact the site with a field camp. The small quantities of diesel fuel and lubricants (estimated to be less than 300 gallons) needed for running equipment would be staged away from the stream and temporarily stored in a containment system. Distance to airstrip fuel storage facilities precludes using that source for construction. Spill kits would be stored at the site. Equipment operators and workers would be trained in



prevention of fuel spills, use of spill kits and reporting requirements for such spills. All excess fuels and fluids would be removed from the project site and stored in appropriate camp facilities.

On-site interpretive signage as well as at Slaven's Roadhouse on the Yukon River would reduce the potential for issues of public safety and misunderstanding.

## 2.4 Environmentally Preferred Alternative

The environmentally preferred alternative is Alternative B: Restore Lower Creek Channel and Historic Cat Trail by Diverting Flow Back into the Natural Eastern Channel (Preferred Alternative) (Environmentally Preferred Alternative). Diversion of the stream back into the natural channel would allow the existing cat trail to be used with minimal additional work and restore riparian wetlands functions, the natural stream gradient, and improve floodplain function and stability in the natural channel of the lower creek.

## 2.5 Descriptions of Alternatives and Actions Considered But Eliminated from Detailed Study

### 2.5.1 Construction of a Gravel OHV Trail on the Upper Historic Trail

This potential alternative was eliminated from further consideration based upon several years of unsuccessful attempts to make the southern segments of the upper historic trail once again usable for light motor vehicles. The upper trail is identified as a contributing component of the Coal Creek National Historic District and is a State Right of Way (ROW) quit-claim deeded by the government in 1959. The ROW is 7 miles long and 100 feet wide and is based upon Alaska Road Commission construction activities in the 1930s. Records and oral history interviews indicate that during the most active mining decades from the 1930s into the 1960s, great effort and expense were incurred annually by the mining companies, to repair and maintain that trail for truck access to the river.

Construction of a simple OHV trail on the upper historic cat road along the ridge using proper culverts and ditches was considered in a preliminary draft environmental assessment in 2002; however, such a trail promised to be very costly, require wetland mitigation and promise extensive maintenance every spring and following high precipitation weather events. The environmental assessment was never completed. Therefore, all staging work and plans to continue to attempt to connect the upper trail from camp to the river were halted in 2002.

### 2.5.2 Channel Straightening Without the Use of Gabion Baskets

(One NPS consultant suggested that we: "straighten the creek bed by dozing out the gravel bar on the right bank and pushing it into the project area to fill channel that you want to block. This will divert the creek away from the project area and fill in the soon-to-be-abandoned channel.")

This alternative strategy was considered but eliminated from further analysis for the following reasons.

Straightening out the channel and taking the curve out by dozing out the gravel bar on the right bank and pushing it into the project area will increase the energy gradeline (water slope) by creating a shorter reach with the same elevation drop.

The frictional force of water flowing downstream is called shear stress, and acts both on banks and beds. It can be calculated as the product of the weight of water multiplied by the slope of the channel multiplied

	<b>Alternative A: No Action</b>	<b>Alternative B: Restore Lower Creek Channel and Cat Trail by Diverting Flow Back into the Natural Eastern Channel</b>
<b>Water Quality</b>	Under this alternative there would likely be minor adverse impacts to water quality at and below the revetment site; the degree of impact could increase to moderate with vehicular use on the cat trail when water is flowing in it.	Water quality impacts would be negligible at and below the revetment site during construction activities. The water quality would improve to a moderate degree with full flows in the natural eastern channel.
<b>Wetlands and Floodplains</b>	Wetlands identified along the historic meandering channel near the confluence with the Yukon River would continue to exhibit reduced surface flow due to the loss of 25-50% of the discharge into the cat trail and separate mouth	Impacts to identified wetlands would be negligible as a result of construction and to the floodplain below generally minor. Restoration of full flow to the natural channel would have moderate benefits lead to increased stability
<b>Vegetation</b>	Aerial extent of riparian vegetation would be reduced to a minor degree adjacent to the increasingly degraded overflow channel	Impacts to riparian vegetation at the construction site would be negligible. The aerial extent of vegetation would increase in the along the cat trail in the dry channel once flow is diverted away
<b>Fisheries</b>	Resident fish populations and the habitat upon which they depend in the natural channel would be impacted to a minor degree by continued stream aggradation and decreased nutrient availability as a result of increased summer water volume in the cat trail channel.	Adverse impacts to fisheries would be minor at most. Beneficial impacts resulting from increased natural flows in the old eastern channel and restoration of more natural ecological function would be moderate.
<b>Visitor Use and Recreation</b>	No action would result in a continuation of the current difficulties experienced by recreational visitors trying to walk between the river and the camp. Periods of low water (thus easy walking on the trail) occur infrequently in most summers and are unpredictable until late fall. Recreational visitor access would be limited to air or walking along the creek and use bypass trails to the dredge but would be limited by moderate and high water events which would flood the trails.	Recreational visitor access would improve. Visitors would be able to walk on the cat trail between the river and the camp. Impacts to visitor experience in the Historic District as a result of visual and noise intrusion during construction on the lower trail between the dredge and river would be temporary and minor.
<b>Park Management</b>	The no action alternative would result in a continuation of the current limitations on government vehicular access using the lower trail from the river to the camp and return. Periods of low water occur infrequently in most summers and are unpredictable until late fall. Park operations and public services would be uncertain and inefficient. Full summer operational effectiveness, as envisioned in various park plans, would not be possible.	Impacts on park management activities would be negligible and of short duration. Access for both park management (vehicular) and the general public (foot) would be significantly improved once the structure is in place and the lower trail is usable. This would result in greater operational effectiveness and increased visitor and employee safety in the Historic District.

Table 2.1: Summary of Impacts of Alternatives

by a factor of the shape of the channel. All else staying the same, increasing the slope of the channel (by making the channel shorter in length) increases the shear stress, or the ability to erode material. The channel will try and achieve dynamic stability by returning to a slope where the material effectively resists the erosive forces of the flow. The result is that the channel will reduce the slope by lengthening

the channel. Experienced river morphologists and engineers have long noted that ‘channel straightening’ generally has the opposite and unintended effect (Leopold, 1994; Rosgen, 1996).

A newer shorter little channel on the right side may work for a little while in low water. But when a bankfull flood event occurs, the water that has enough tractive force to create scour pools in a longer, slower channel will probably erode out of a new shorter, higher velocity channel, and will erode away the fill material dumped into the old channel.

The gabion basket design with toe scour protection represents state-of-the-art design for bank protection for projects where larger rock (riprap) is not available (AKDOT, 1995; AASHTO, 1992; FHWA, 2000; Williams and Doeing, 2003; URS, 2002). Such techniques are frequently used to protect critical highway infrastructure from the effects of bank erosion. The key to successful implementation is the toe scour protection, which should be placed low enough in the streambed to prevent undermining for the design flood.

Design calculations for the toe protection gabion placement included the following. A variety of techniques to estimate depth of scour are commonly recognized and used by professional river engineers. The maximum probable depth of scour for Coal Creek was estimated at 8.5 feet, using Blodgett’s relationship (FHWA, 2000) and field data from the Coal Creek project site. This equation is generally considered conservative, and provides a depth of scour estimate for the equivalent of a 500-year flood (Williams, 2001). Other investigators have reported that the maximum scour depth is observed to be 1 to 2 times the average flow depth (Richardson and Davis, 1995). Placing the toe protection at a depth of 3 feet below the low point of the channel was an engineering judgement to provide reasonable protection from toe scour failure, while allowing a practical construction scenario in a remote area with limited heavy equipment availability.

### 3.0 Affected Environment

#### 3.1 Project Area

The Coal Creek drainage, one hundred and ten miles downstream from Eagle, is the location of the last large scale mining operation in the preserve. The lower drainage contains extensive evidence of nearly continuous gold mining activities from hand operated placer mining begun in 1902 to industrial gold dredge operations that continued until 1977. These activities are well-documented (Beckstead, 2003) and have resulted in extensive morphological changes to the lower Coal Creek channel/floodplain system (Karle, 2004).

The hydrology of Coal Creek is typical of a small-order perennial stream in the Yukon hydrologic region (Curran et al., 2003). Water flow is derived from precipitation and shallow ground water, showing seasonal discharge peaks from snow melt and/or precipitation. The typically drier months of June and July generally result in a low discharge rate following spring breakup, until late summer precipitation events increase runoff levels. A discharge measurement made on June 14, 2004, at which time Coal Creek exhibited ‘typical mid-summer low flow, according to long-term observers. The measured discharge was 30.7 cubic feet per second. Two NPS hydrologists measured a similar low flow during a site visit on June 8, 1999 (Ken Karle and Nancy Deschu, pers. Comm.)

To assist with the determination of hydraulic forces on bank revetment structures, an estimation of the magnitude and frequency of peak stream flows is required. As Coal Creek is an ungaged site, flood magnitudes are computed by using predictive regional regression equations (Curran et al., 2003). These equations, which require the determination and use of physical and climatic drainage basin characteristics,

provide estimations of the 2-, 5-, 10-, 25-, 50-, 100-, 200-, and 500-year recurrence interval flood magnitude. Statistically significant basin characteristics that vary by region throughout the State include basin area size, mean basin elevation, mean annual precipitation, mean minimum January temperature, and percentage of basin covered by forest or covered by lakes and ponds. Estimations for flood magnitudes for the lower Coal Creek site are found in Table 1.

Table

Recurrence Interval (yrs)	Magnitude (cfs)
Q <sub>2</sub>	1195
Q <sub>5</sub>	1940
Q <sub>10</sub>	2510
Q <sub>25</sub>	3270
Q <sub>50</sub>	3880
Q <sub>100</sub>	4460
Q <sub>200</sub>	5110
Q <sub>500</sub>	5900

3.1

Estimations of Flood Magnitudes

Estimations of flood stage at the project site were made using standard hydraulic methods. A cross-section was surveyed at the project site; a slope survey was conducted through the site to establish the energy grade line, using water surface elevations. Using the Manning's n equation, the discharge measurement was utilized to calibrate the Manning's n roughness value for the channel. Once calibration was achieved, estimations of stage elevations for increasing flood frequency magnitudes were calculated, using the slope-area method.

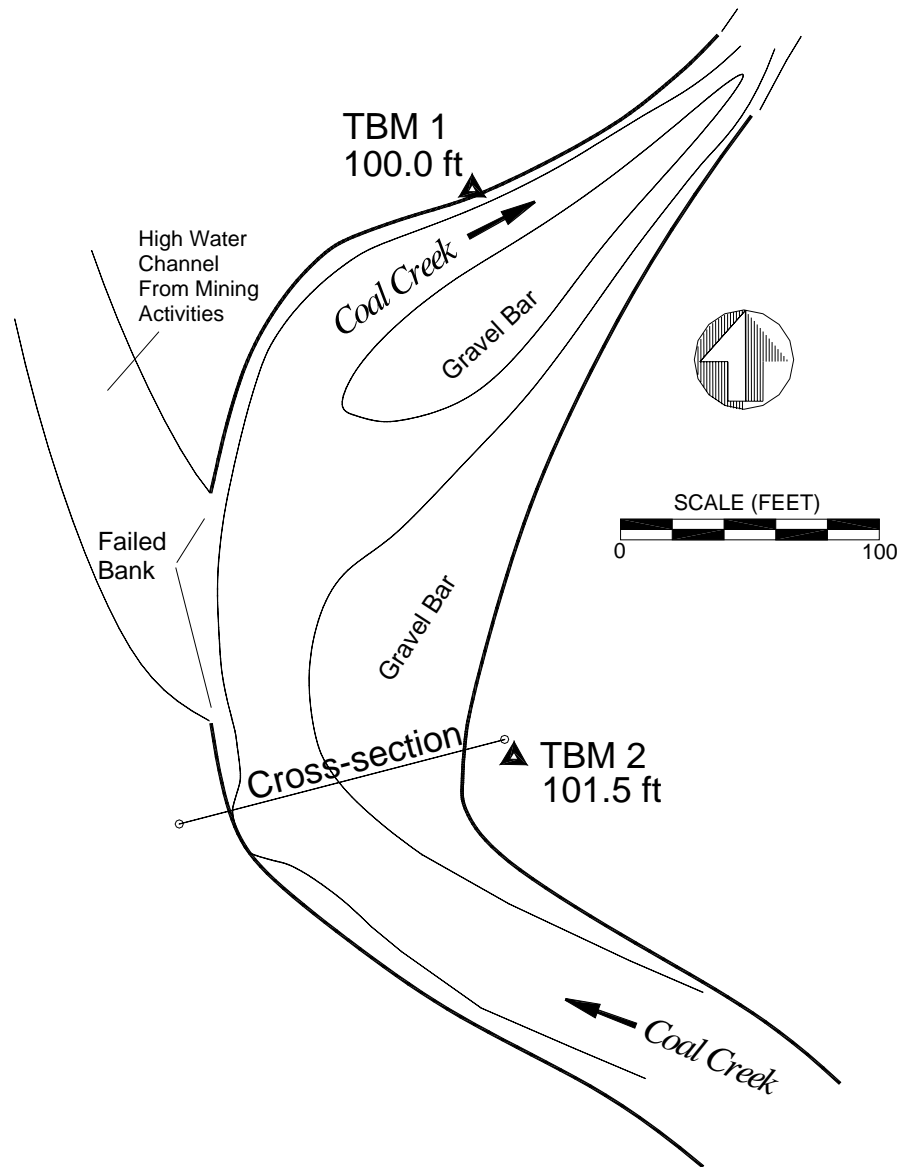


Figure 3.1.1: Existing conditions at Coal Creek.

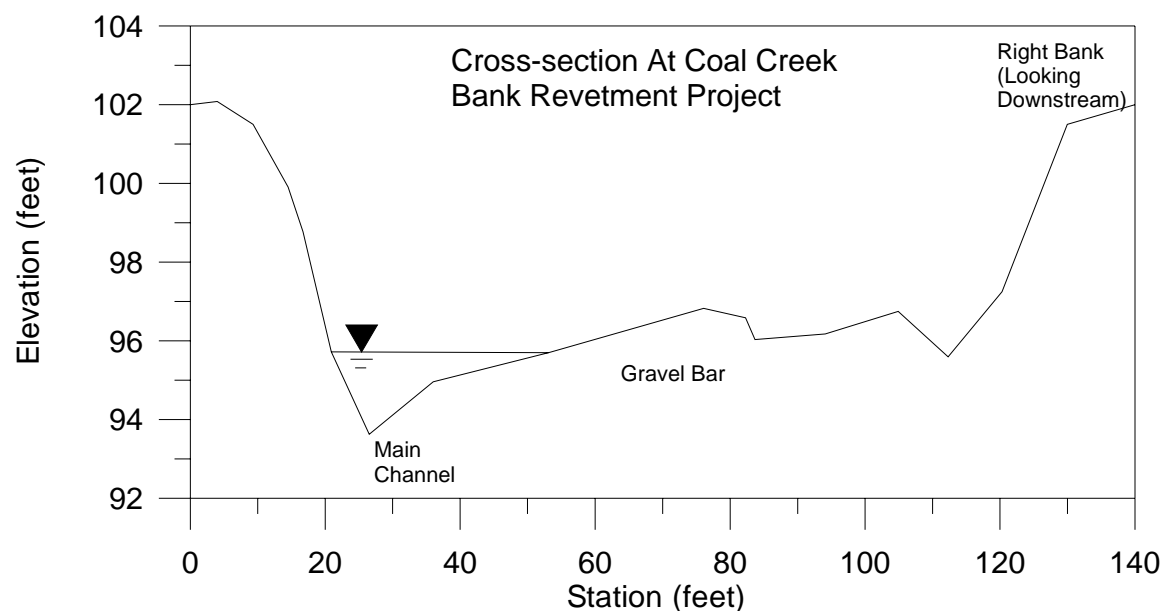


Figure 3.1.2: Stream cross-section at project site.

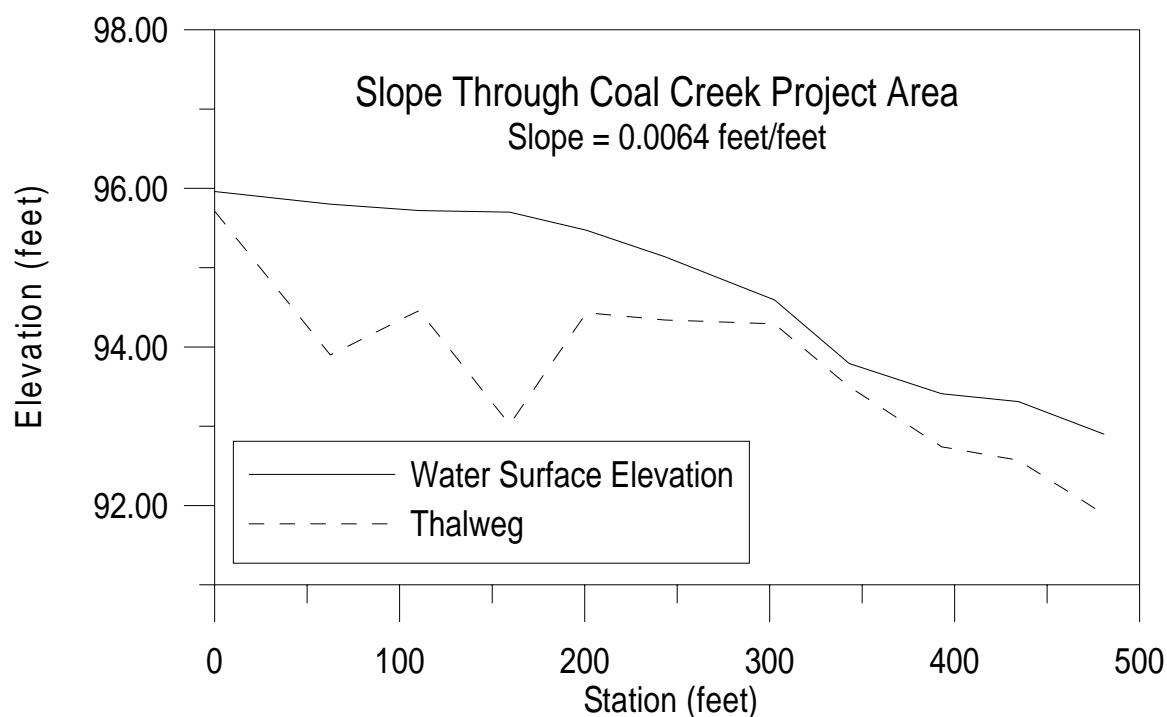


Figure 3.1.3: Slope through project area.

Wildlife in the lower Coal Creek drainage is typical of that elsewhere in eastern Interior Alaska. Moose are present in low to moderate numbers and in summer months are commonly seen in subalpine habitats and in stream-margin shrublands. Black bears occasionally wander through the area. The riparian habitat supports a variety of small mammals including snowshoe hares, beaver, porcupine, mink, lynx, marten, red squirrels, red fox and microtine species (GMP, 1985).

The majority of bird species in the preserve and in the Coal Creek drainage are migratory but the mixed shrub habitat and mosaic of vegetation types in the diversion area supports a number of passerine species, ruffed and spruce grouse and shorebirds. Raptors hunt the area and some species of accipiters and owls can be expected to nest in the area.

A variety of non-anadromous fish species use the creek environment for spawning, rearing and overwintering habitat.

A large number of historic buildings and artifacts are dispersed throughout the lower drainage including Slaven's Roadhouse built in 1932 at the mouth of the creek and Coal Creek Camp, a complete mining camp. However, there are no historic buildings near the proposed diversion structure nor any within the floodplain downstream that might be impacted by diverting the creek flow. Since the soils were washed away in stripping operations several decades ago, there is no likelihood of archeological resources in situ at the revetment site.

### 3.2 Resource Topics

#### Water Quality

At lower discharge levels the water runs fairly clear with some tannin-stain. However, at moderate or high levels, the braided nature of the reach above the project site can greatly increase turbidity. In Coal Creek, dissolved oxygen, pH, alkalinity, hardness and metal concentrations of the majority of water sampled upstream, within and downstream of mined areas were within EPA (1986) recommended levels for protection of aquatic life. The pH of some headwater-area samples taken were below EPA recommended levels. Relatively high sulfate concentrations (likely from small coal deposits located near the middle and upper reaches) may be limiting to sensitive aquatic invertebrates.

#### Wetlands and Floodplains

The US Fish and Wildlife Service (USFWS) conducted a wetlands inventory in the preserve as part of the National Wetlands Inventory (NWI) in 1995 and did not delineate any wetlands, other than the bed of Coal Creek (including where it flows into the cat trail channel), at the restoration/diversion site. Wetlands are delineated for most of the stream reach downstream of the revetment site to the confluence with the Yukon River. A NPS Hydrologist visited and assessed the proposed revetment site as part of a preliminary field survey in 1999 and did not identify additional wetlands.

A review of black and white aerial photos of the creek in 1987 clearly show the extent of landscape alteration downstream from the Coal Creek Camp. "The original channel form, apparently abandoned because of mining operations, is easily distinguishable in some lower sections to the east of the current channel. That channel appears to be a slightly entrenched, meandering, single-thread channel with a well-developed floodplain. The sinuosity (ratio of stream distance to linear distance) is high, up to 2.1, and the width-depth ratio of the channel appears low. The active section of channel which was directly impacted by mining displays an entirely different channel type typical of such disturbance. The mined stream sections have unstable braided channels along many reaches. Piles of mine tailings have replaced much of the streambed native material. Most floodplain soil appears to have been washed downstream. Riparian vegetation is sparse or absent, and habitat value has been severely reduced" (Karle, Feb. 2004).

"Downstream of the heavily mined section [in the area of the proposed revetment structure], Coal Creek returns to what appears to be its original channel. As the braided low sinuosity channel returns to a high sinuosity single-thread channel, the slope flattens out. The channel here is single-thread and sinuous.

However, the results of the heavily disturbed upstream section are apparent through this reach, and channel adjustments due to the large upstream sediment supply are apparent. Exaggerated point bars are readily apparent, and are probably the result of changing hydraulic conditions which can no longer transport the sediment supply” (Karle, Feb. 2004).

The high water channel that has cut through at the beginning of the bend to flow in the old cat trail is approximately 90 feet in width. This channel is not considered natural due to the extensive mining impacts upstream and the re-channelization and stripping of overburden at the site. This “captured cat trail channel” does not again join the original channel before reaching the Yukon River. For approximately 90 feet above and below the cut through the bank is vegetated with alder, willow species, and small paper birch and white spruce .

The “natural channel” is the term NPS staff use to describe the eastern channel as it exhibits the hydrologic functions, riparian features, vegetative composition and meanders one would expect in a riverine setting undisturbed by human activities along any similar stream in the region.

### Vegetation

The riparian habitat at the revetment site is largely dense willow or alder thickets with some second-growth birch trees and white spruce on the stable banks (Mining EIS, 1990). The site is typical of mixed boreal forest along small streams in the interior.

### Fisheries

The Yukon and some tributaries in the Yukon-Charley Rivers National Preserve provide important habitat for both anadromous and up to fourteen species of resident of fish. Species present in the Yukon include Chinook and chum salmon, northern pike, Arctic grayling, burbot, longnose suckers, slimy sculpin and several whitefish species (NPS Mining EIS, 1990).

Arctic grayling are common in Coal Creek and have been observed as far as 13.5 miles upstream from the Yukon River confluence. Although grayling have been observed or captured throughout the drainage, abundance is thought to be low, owing in part to drastic degradation of the watercourse and associated riparian habitats (NPS Mining EIS, 1990).

Round whitefish are also known to occur in Coal Creek and have been documented as far upstream as Colorado Creek, approximately eight miles upstream from the Yukon. Slimy sculpin have been documented in Coal Creek but as with round whitefish, numbers are believed to be low. Neither adult nor juvenile salmon have been found to occur in Coal Creek and for this reason, the stream is not listed in the State of Alaska Anadromous Fish Stream Catalog.

### Visitor Use and Recreation

Recreational use in lower Coal Creek occurs primarily in the summer months with the peaks in July and early September. Recreational activities include day-hiking and site visits originating from Slaven’s Roadhouse on the Yukon River (river floaters) or the airstrip (fly-in visitors). Regarding motorized access, the park’s 1985 General Management Plan states:

Access to the preserve will continue to be by commercial and private aircraft, boats, and in winter, also by snowmachines and dogleds. Recreational use by other off-road, or all-terrain vehicles will be prohibited. The only overland access by mechanized vehicles will be



snowmachine travel in connection with subsistence activities. Motorized watercraft will be permitted according to existing laws and regulations. (page 61)

The main attraction site near the revetment site is the dredge (1/4 mile south). Visitors from the river walk along the cat trail adjacent to the project site to reach the dredge. Summer visitation to the dredge is not documented but is estimated to be between 100-300 people annually .

### Park Management

Motorized and foot access between the Yukon River and the dredge, airstrip and camp on the lower trail (when water conditions permit) is generally for purposes of education and outreach with small visitor groups and transporting supplies for a wide variety of administrative activities including building restoration, maintenance, cultural resource inventories and camp use.

## 4.0 Environmental Consequences

### 4.1 Introduction

This chapter provides an evaluation of the potential effects of impacts of each of the alternatives on the resources described in the issues statements presented in Chapter 1, Purpose and Need for Action.

### 4.2 Impacts of Alternative A: No Action Water Quality

**Direct and Indirect Impacts:** The creek would continue to exhibit increased turbidity and sediment loads during moderate and high water flow regimes due to the extensive braided channels and instability of the mined area in the reach above the proposed diversion site. Since 25 to 50% of the stream volume now enters the cat trail instead of coursing in the natural eastern channel impacts to water quality would occur. As the stream gradient decreases in the natural channel below the revetment site due to increased velocity and erosion in the cat trail channel and increased deposition in the natural channel, decreased stream stability and a reduction in water quality would occur to a minor degree. However, vehicular use of the cat trail at low water levels would further increase turbidity and slightly increase the potential for small fuel spills in the water column, potentially bringing impact levels up to moderate.

**Cumulative Impacts:** In the cumulative case, the majority of effects on water quality have been caused by decades of placer gold mining activities in the Coal Creek drainage. Approximately 769 acres have been affected by mining-associated activities. Most of this acreage remains as barren or partially re-vegetated tailings along the main stream channel from Colorado Creek downstream to Pendergast Creek. This braiding and lack of vegetation causes channel instability even at moderate water levels. Impacts to water quality downstream through the revetment site to the mouth would continue at a minor to moderate level depending upon levels of government vehicular use.

**Conclusion:** Under this alternative there would likely be minor adverse impacts to water quality at and below the revetment site; the degree of impact could increase to moderate with vehicular use. The level of effects on water quality with this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

### Wetlands and Floodplains

**Direct and Indirect Impacts:** Wetlands identified along the historic meandering channel near the confluence with the Yukon River would continue to exhibit reduced surface flow and related natural disturbance effects (reduced wetland recharge ability, increased erosion and sediment deposition), due to the loss of 25-50% of the discharge into the cat trail and separate creek mouth. At moderate to high flows, the natural channel would continue to aggrade and slow with reduced flows as the less sinuous cat trail channel degrades.

**Cumulative Impacts:** In the cumulative case, the majority of effects on vegetation have been caused by decades of placer gold mining activities in the Coal Creek drainage. Approximately 769 acres have been affected by mining-associated activities. Most of this acreage remains as barren or partially re-vegetated tailings along the main stream channel from Colorado Creek downstream to Pendergast Creek. This braiding and lack of vegetation causes channel instability. Impacts to wetlands and floodplains downstream through the revetment site would continue at a moderate level

**Conclusion:** The floodplain below the revetment site would be moderately impacted as it continues to aggrade and tend toward greater instability as the volume of water entering the overflow channel following the cat trail increases. Wetlands adjacent to the lowest reaches of the creek would receive decreased water flow causing moderate impacts to extent and wetland function. The level of effects on wetlands and floodplains with this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

### Vegetation

**Direct and Indirect Impacts:** Vegetation and soils in the riparian zone along the stream bank at the cut-off channel/diversion site would be eroded by high water as braiding increases with continued multiple channel formation and further abandonment of the natural (eastern) channel.

**Cumulative Impacts:** In the cumulative case, the majority of effects on vegetation have been caused by decades of placer gold mining activities in the Coal Creek drainage. Approximately 769 acres have been affected by mining-associated activities. Most of this acreage remains as barren or partially re-vegetated tailings along the main stream channel from Colorado Creek downstream to Pendergast Creek. Impacts to vegetation would continue at a moderate level.

**Conclusion:** Aerial extent of riparian vegetation would be reduced to a minor degree adjacent to the increasingly degraded overflow channel. The level of effects on vegetation with this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

### Fisheries

**Direct and Indirect Impacts:** Fish populations using the reach below the revetment site for spawning, rearing and perhaps over-wintering habitat would be impacted to a minor degree by increased sediment loads and decreased flow in the natural channel. This would have a minor impact on resident fish populations in terms of increased water temperature, decreased escape habitat and decreased availability of nutrients. Deeper pools for over wintering fish would be reduced in number and extent having a minor impact on over-winter survival of some fish species. Stream habitat in the cat trail over flow channel would remain poor quality (straight channel with no pools or riffles or normal sinuosity).

**Cumulative Impacts:** In the cumulative case, the majority of effects on fish have been caused by decades of placer gold mining activities in the Coal Creek drainage. Past placer mining activities would continue to have minor impacts on fish populations through alteration of habitat. Impacts to fish would remain at a moderate level.

**Conclusion:** Resident fish populations and the habitat upon which they depend in the natural channel would be impacted to a minor degree by continued stream aggradation and decreased nutrient availability as a result of increased summer water volume in the cat trail channel. The level of effects on fish with this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

### Visitor Use and Recreation

**Direct and Indirect Impacts:** No action would continue the current prohibition on public vehicular access using the lower trail from the river to the camp and return. Access would be limited to foot or air access between the river, dredge and camp in the summer months. Periods of low water occur infrequently in most summers and are unpredictable until late fall making creek crossings unsafe. Visitors would continue to be able to walk along the stream and use bypass trails to the dredge but would be limited by moderate and high water events.

**Cumulative Impacts:** In the cumulative case, the majority of effects on visitor recreation caused by decades of placer gold mining activities in the Coal Creek drainage are inconsequential as this is a primary management goal for the area and a key reason for visitation. Stream flow in the lower cat trail impedes visitor access in the summer to a moderate degree.

**Conclusion:** The recreational opportunities of some visitors would be limited from a minor to moderate degree by being unable to make the trek to the dredge due to the difficulty of using side trails on the stream terraces and uneven terrain. The level of effects on visitor use and recreation with this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

### Park Management

**Direct and Indirect Impacts:** The no action alternative would result in a continuation of the current limitations on vehicular access using the lower trail from the river to the camp and return during most of the summer. Periods of low water occur infrequently in most summers and are unpredictable until late fall. Park operations and public services would be uncertain and inflexible. The high cost and limitations of air delivery for supplies would continue to hamper operational effectiveness at the camp and airstrip. Full summer operational effectiveness, as envisioned in various park plans, would not be possible.

**Cumulative Impacts:** In the cumulative case, the majority of effects on administrative activities caused by stream flow in the cat trail channel would be moderate as vehicular access would continue to be uncertain and difficult. Park management goals for the Historic District would be difficult to attain. Stream flow in the lower cat trail impedes appropriate visitor access in the summer to a moderate degree.

**Conclusion:** Administrative access would be limited to foot or air access between the river, dredge and camp in an unpredictable way in the summer months which would be a moderate impact to the efficiency and effectiveness of transportation of supplies and people along the lower trail to manage the historic district and meet visitor needs. The level of effects on park management with this alternative would not

result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

#### 4.3 Impacts of Alternative B: Restore Lower Creek Channel and Cat Trail by Diverting Flow Back into the Natural Eastern Channel

##### Water Quality

**Direct and Indirect Impacts:** The maximum allowable fines content for the gabion basket fill is 10%. Though such fines may increase turbidity slightly during the first several flood flows, the increase is expected to be undetectable from the high background turbidity observed in Coal Creek during high water events and of short duration. Extensive riparian disturbance upstream on Coal Creek results in abnormally high turbidity and suspended sediment levels during high water events; such turbidity on previously mined streams has been well documented. Additionally, the gabion structure is expected to reduce bank erosion along several hundred feet of bank, which was observed to have substantial fines content.

Permitting agencies (Corps of Engineers, 2004) recommendations and general fluvial studies indicate that construction of the bank revetment in low water conditions, while temporarily diverting the stream flow to the other side of the gravel bar, would result in fewer fine materials being introduced into the water column thus minimizing the impact of increased turbidity and reducing the duration of sediment input. More of the structure can be constructed in dry conditions adjacent to the channel. Heavy equipment operations will occur away from the flowing water to the greatest extent possible.

**Cumulative Impacts:** In the cumulative case, the majority of effects on water quality have been caused by decades of placer gold mining activities in the Coal Creek drainage which have altered natural functions. Cumulatively, these other past, present, and reasonably foreseeable future actions would have negligible impacts on water quality. The additional contribution of minor positive impacts on downstream water quality from this alternative results in a continued negligible rating for overall cumulative impacts on water quality.

**Conclusion:** Water quality impacts would be negligible at and below the revetment site during construction activities. The water quality would improve to a moderate degree with full flows in the natural eastern channel. The level of effects on water quality with this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

##### Wetlands and Floodplains

**Direct and Indirect Impacts:** The US Fish and Wildlife Service (USFWS) conducted a wetlands inventory in the preserve as part of the National Wetlands Inventory (NWI) in 1995 and did not delineate any wetlands, other than the channel of Coal Creek, at the restoration/diversion site. The wetlands function and ecological health near the confluence with the Yukon River would be improved with increased stream flow and natural fluctuations resulting from diversion. The low quality wetlands in the channel of Coal Creek that flows within the cat trail would become vegetated over time.

By redirecting the water out of the cat trail and back into the original creek channel, the flow of water within the creek would be improved, moving the floodplain toward more natural conditions and increased stability.

Gravel borrow areas as material sites are all dry reworked dredge tailings piles with no impact on wetlands or the floodplain.

**Cumulative Impacts:** In the cumulative case, the majority of effects on wetlands and floodplains have been caused by decades of placer gold mining activities in the Coal Creek drainage which have altered natural functions. Cumulatively, these other past, present, and reasonably foreseeable future actions would have negligible impacts on wetlands and floodplains. The additional contribution of moderate positive impacts on downstream functions from this alternative results in a continued negligible rating for overall cumulative impacts on wetlands and the floodplain.

**Conclusion:** Impacts to identified wetlands would be negligible and to the floodplain below generally minor and leading to increased stability and more natural floodplain function which would be beneficial. The level of effects on wetlands/floodplains with this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

### Vegetation

**Direct and Indirect Impacts:** Site evaluation and analysis of the mixed riparian vegetation growing at the revetment site indicates that the project area has been repeatedly disturbed by mining activities and the unstable floodplain above the site. Less than 1/10 acre of existing vegetation would be disturbed or crushed by heavy equipment and construction. Adverse impacts to vegetation resulting from construction would be negligible. Benefits to vegetation would include an increase in the extent and diversity of riparian vegetation resulting from reducing flows into the cat trail channel and thereby increasing disturbance events in the natural channel as a result of greater volume fluctuations.

**Cumulative Impacts:** In the cumulative case, the majority of effects on vegetation have been caused by decades of placer gold mining activities in the Coal Creek drainage. Approximately 769 acres have been affected by mining-associated activities. Most of this acreage remains as barren or partially re-vegetated tailings along the main stream channel from Colorado Creek downstream to Pendergast Creek.

Cumulatively, these other past, present, and reasonably foreseeable future actions would have moderate impacts on vegetation. The additional contribution of minor positive impacts from this alternative results in a continued moderate rating for overall cumulative impacts for vegetation.

**Conclusion:** Impacts to riparian vegetation at the construction site would be negligible. The aerial extent of vegetation would increase in the along the cat trail in the dry channel once flow is diverted away. The level of effects on vegetation of this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

### Fisheries

**Direct and Indirect Impacts:** Several small species of freshwater fish are documented in Coal Creek so it is likely that some minnows, shore edge habitat and aquatic insects and nutrient flow upon which they depend, would be temporarily impacted to a negligible extent over the 1/10 acre of aquatic habitat involved. Most minnows will likely leave the immediate area once construction begins. This would be of short duration as the bypass channel would carry the stream flow during revetment construction as required in the agency permits. Over-wintering habitat pools would improve in quality in the natural channel with increased water flows and scouring.

Fish habitat and local populations would generally improve as a result of the stream diversion back into the natural channel from the site to the confluence with the Yukon River (approximately 3,700 feet) as the ecological and hydrological functions of the natural channel are restored.

**Cumulative Impacts:** In the cumulative case, the majority of effects on fish have been caused by decades of placer gold mining activities in the Coal Creek drainage which have altered fish habitat. Cumulatively, these other past, present, and reasonably foreseeable future actions would have moderate impacts on fisheries. The additional contribution of moderate positive impacts from this alternative results in a continued minor rating for overall cumulative impacts for fisheries.

**Conclusion:** Adverse impacts to fisheries would be minor at most. Beneficial impacts resulting from increased natural flows in the old eastern channel and restoration of more natural ecological function would be moderate. The level of effects on fisheries of this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

### Visitor Use and Recreation

**Direct and Indirect Impacts:** Project construction and material transport activities would occur over 1-2 weeks between the construction site, the dredge and the airstrip (approximately 3 miles of trail). Although these activities would be conducted in the fall well after peak visitor season they would cause temporary impacts to visitor experience, visitor safety and accessibility. Equipment noise would be loud but of intermittent intensity during revetment construction and is expected to have a moderate impact on visitor experience and the natural soundscape. Visual intrusion would be negligible. There would be a small reduction in visitor safety due to the presence of heavy equipment on the trail during construction; however, extra precautions would be taken to reduce the risk of an accident occurring. Heavy equipment on the trail also could require visitors to move off-trail occasionally which would slow but not impede access.

Future public access would be greatly improved by providing a passable trail unaffected by unpredictable high water events. Some increase in motorized administrative use of the cat trail would have minor adverse impacts on visitors during project work and subsequent camp use. Motorized recreational use would continue to be prohibited in the valley and on the lower cat trail.

**Cumulative Impacts:** In the cumulative case, the majority of effects on visitors and recreational experiences as a result of construction activities would be minor. Cumulatively, these other past, present, and reasonably foreseeable future actions would have minor impacts on visitor use patterns and activities. The additional contribution of moderate positive impacts for visitor foot access from this alternative results in a continued minor rating for overall cumulative impacts on visitor recreation.

**Conclusion:** Impacts to visitor experience in the Historic District as a result of visual and noise intrusion during construction on the lower trail between the dredge and river would be temporary and minor. Future public access and opportunities for recreational activities would be greatly improved. The level of effects on visitor use and recreation of this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

## Park Management

Direct and Indirect Impacts: Park management activities and access from the Yukon River to the dredge, airstrip and historic camp would be greatly improved once the cat trail is not flowing water. Operational costs would be reduced and efficiency increased to a moderate degree and lasting over many years. Annual maintenance of the revetment structure and cat trail would be minor impacts on park management.

Cumulative Impacts: In the cumulative case, the majority of effects on administrative activities and access have been caused by the instability of the braided channels above the revetment site and stream capture of the lower cat trail. Cumulatively, these other past, present, and reasonably foreseeable future actions would have minor impacts on park management. The additional contribution of moderate positive impacts from this alternative results in a continued minor rating for overall cumulative impacts for park management.

Conclusion: Impacts of construction activities on park management activities would be negligible and of short duration. Access for both management and the general public would be greatly improved once the structure is in place and the lower trail is usable. This would be beneficial for the efficiency and effectiveness of park management activities and public trust responsibilities. The level of effects on park management of this alternative would not result in an impairment of preserve resources that fulfill specific purposes identified in the preserve enabling legislation or that are key to the natural and cultural integrity of the preserve.

## 5.0 Consultation and Coordination

### Overview

Ways for improving access between Coal Creek Camp and the Yukon River have been studied and intensely debated by NPS staff since the early 1990s. The steadily increasing spectrum of resource work and administrative use of the camp facilities have accentuated the need for improved summer access. Proposed actions, preliminary construction designs and impact topics were identified and refined through preserve interdisciplinary team scoping and consultation with the State Historic Preservation Officer, Alaska Department of Natural Resources Division of Habitat and Permitting, U S Fish and Wildlife Service (Endangered Species), NPS Water Resources Division, analysis by civil engineers and the Army Corps of Engineers (Fairbanks) . Topics identified for impact analysis include: wetlands, floodplain, water quality, aquatic resources, non-anadromous fish species, riparian vegetation, cultural resource and landscape values, park management activities, visual intrusion, recreational experience and stream flow characteristics.

### Agencies/Organizations/Persons Contacted

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#### Selected References

U S National Park Service, Department of the Interior

1982. Environmental Overview and Analysis of Mining Effects. Yukon-Charley Rivers National Preserve.

1990. Final Environmental Impact Statement on Cumulative Impacts of Mining. Yukon-Charley Rivers National Preserve.

1994. Eagle Development Concept Plan and Environmental Assessment. Yukon-Charley Rivers National Preserve

2002. Cultural Landscapes Inventory. Coal Creek Historic Mining District. Yukon-Charley Rivers National Preserve

2002. Coal Creek Historic Mining District Management Guide. Yukon-Charley Rivers National Preserve

2003. The World Turned Upside Down: A History of Mining on Coal Creek and Woodchopper Creek, Yukon-Charley Rivers National Preserve, Alaska. Doug Beckstead

#### Other References

Alaska Department of Transportation and Public Facilities. 1995. Alaska Highway Drainage Manual. State of Alaska, Juneau, AK.

AASHTO, 1992. Highway drainage guidelines. Published by American Association of State Highway and Transportation Officials, Inc., Washington, D.C.



Curran, J. H., D. F. Meyer, and G.D. Tasker. 2003. Estimating the magnitude and frequency of peak stream flows for ungaged sites on streams in Alaska and conterminous basins in Canada. U.S. Geological Survey, Water-resources investigations report 03-4188. Anchorage, AK.

Federal Highway Administration. 2000. Design of riprap revetment. Hydraulic Engineering Circular 11SI, U.S. Department of Transportation, FHWA #IF-00-022.

Karle, Kenneth. February 2004. Feasibility Assessment and Preliminary Design: Channel Diversion of Lower Coal Creek Through the use of Bank Revetment. Hydraulic Mapping and Modeling.

\_\_\_\_\_. July 2004. Gabion Revetment Design for Lower Coal Creek. (Hydraulic Mapping and Modeling.

Leopold, L.B. 1994. A view of the river. Harvard University Press, Cambridge, MA.

Richardson, E.V., D.B. Simons, and P.F. Lagasse. 2001. River engineering for highway encroachments; highways in the river environment. National Highway Institute, Arlington, VA.

Richardson, E.V., and S.R. Davis. 1995. Evaluating scour at bridges. Hydraulic Engineering Circular No. 18 (HEC-18), prepared for Federal Highway Administration, Publication No. FHWA-IP-90-017, Washington, D.C.

Rosgen, D. 1996. Applied river morphology. Wildland Hydrology, Pagosa Springs, CO.

URS. 2002. Development in the river environment. A seminar; conducted by URS Corporation and the Alaska section of the American Water Resources Association, Anchorage, AK. May 2002.

Williams, D., and B. Doeing. 2003. Predicting bed scour for toe protection design in bank stabilization projects. Professional development course, International Erosion Control Association.

Williams, D. 2001. Advanced design technique for stream bank protection. Professional development course, International Erosion Control Association.

## **Appendix A: Subsistence Section 810(a) Summary of Evaluation and Findings**

### **ANILCA SECTION 810(a)**

#### **I. INTRODUCTION**

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluations of potential restrictions to subsistence uses which could result from the National Park Service (NPS) diverting the flow of lower Coal Creek into a natural channel at a bend approximately 0.75 miles above the confluence with the Yukon River in Yukon-Charley Rivers National Preserve.

#### **II. THE EVALUATION PROCESS**

Section 810(a) of ANILCA states:

"In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands . . . the head of the federal agency . . . over such lands . . . shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency -

- (1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to section 805;
- (2) gives notice of, and holds, a hearing in the vicinity of the area involved; and
- (3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

ANILCA created new units and additions to existing units of the national park system in Alaska. Yukon-Charley Rivers National Preserve was created by ANILCA Section 201 (10) for the purposes of maintaining the environmental integrity of the entire Charley River basin, including streams, lakes and other natural features in its undeveloped natural condition for public benefit and scientific study; to protect habitat for, and populations of fish and wildlife, including but not limited to the peregrine falcons and other raptorial birds, caribou, moose, Dall sheep, grizzly bears and wolves; and in a manner consistent with the foregoing, to protect and interpret historical sites and events associated with the gold rush on the Yukon River and the geological and paleontological history and cultural prehistory of the area. Except at such times when and locations where to do so would be inconsistent with the purposes of the preserve, the Secretary shall permit aircraft to continue to land at sites in the upper Charley River watershed.

The potential for significant restriction must be evaluated for the proposed action's effect upon "... subsistence uses and needs, the availability of other lands for the purposes sought to be achieved and other alternatives which would reduce or eliminate the use."

### III. PROPOSED ACTION ON FEDERAL LANDS

Alternative B: Restore Lower Coal Creek Channel and Trail by Diverting Flow Back into the Natural Eastern Channel is the NPS preferred alternative and environmentally preferred alternative. The proposed action involves the construction of a bank revetment on the west bank of Coal Creek upstream from the confluence with the Yukon River. A basket structure would divert the creek flow to the east into the natural channel and prevent increased degradation of the overflow channel that has cut the bank and entered the trail to the river. The bank revetment structure would be approximately 270 feet in length along the left bank of the creek beginning about 90 feet above the cutoff channel. The structure consists of a gabion basket base placed in a shallow excavation in the stream channel to protect against toe scour with gabion mattresses resting on them and sloped to protect the upper bank from erosion.

A full discussion of alternatives, development scenarios, and anticipated effects can be found in the Lower Coal Creek - Trail Restoration Draft Environmental Assessment.

### IV. AFFECTED ENVIRONMENT

A summary of the affected environment pertinent to subsistence use is presented here.

The study area lies within the boundaries of wildlife management units 20E, 25B, and 25C in Yukon-Charley Rivers National Preserve where subsistence uses are allowed in accordance with Title VIII of ANILCA. Qualified subsistence users depend largely on salmon, moose, caribou, ptarmigan, spruce grouse, hare, and fur animal resources. The Preserve is also open to non-subsistence hunting, fishing and trapping. ANILCA protects subsistence uses by local rural residents as a priority consumptive use over other non-subsistence consumptive uses.

Nomadic peoples have used and occupied this region for thousands of years, following caribou herds, hunting moose and Dall sheep black and grizzly bear as well as harvesting both anadromous and resident species of fish. The area supports peoples from at least two distinct bands of Athapaskan Indians, the Han and the Kutchakin. Archeological sites trace their history and use, and may give clues to the earliest human inhabitants of northeastern Alaska. The variety of known archeological sites includes seasonal villages, long- and short-term camps, hunting locales, caribou fences, lookout sites, fish camps and trapping camps. Local rural residents still depend upon resources on NPS lands to sustain a subsistence way of life.

Hunting, fishing, trapping and gathering remain a vital part of a subsistence way of life for local residents. Major subsistence resources include Chinook and chum salmon, fur bearers, waterfowl, black and grizzly bears, moose, wolves, Dall sheep and caribou. Winter trapping efforts concentrate on the harvest of marten, lynx, wolverine, wolves, and fox. These and other subsistence activities occur throughout the year and throughout the Preserve.

#### **Wildlife**

Wildlife in the Coal Creek drainage is typical of that elsewhere in eastern Interior Alaska. Moose are present in low to moderate numbers and in summer months are commonly seen in subalpine habitats and

in stream-margin shrublands. Two caribou herds, the Fortymile and Porcupine, utilize the preserve. Black and grizzly bear range throughout the Preserve and can be found in virtually any habitat; wolves are widely distributed throughout the area and are most commonly found along watercourses where wildlife tends to concentrate. The area supports a variety of small mammals including wolverine, beaver, mink, marten, and fox.

The majority of bird species in the Coal Creek drainage are migratory but include resident species such as ravens, spruce, ruffed and sharp-tailed grouse. Twenty species of raptors have been identified in the Preserve including bald and Golden eagles and a large, breeding population of Peregrine falcons.

### **Fish Resources**

The Yukon and its tributaries in the Yukon-Charley Rivers National Preserve provide important habitat for both anadromous and fourteen species of resident of fish. Species present include Chinook and chum salmon, northern pike, Arctic grayling, burbot, Dolly Varden and whitefish.

In Coal Creek, Arctic grayling are common and have been observed as far as 13.5 miles upstream from the Yukon River confluence; it has been estimated that there are approximately 25 linear miles of grayling habitat within the drainage including small tributary streams and tailings ponds. Although grayling have been observed or captured in throughout the drainage, abundance is thought to be low, owing in part to drastic degradation of the watercourse and associated riparian habitats.

Round whitefish are also known to occur in Coal Creek and have been documented as far upstream as Colorado Creek, approximately eight miles upstream from the Yukon. Slimy sculpin have been documented in Coal Creek but as with round whitefish, numbers are believed to be low. Neither adult nor juvenile salmon are known to occur in Coal Creek and for this reason, the stream is not listed in the State of Alaska Anadromous Fish Stream Catalog.

The construction of the bank revetment to divert the main flow of the stream back into the natural channel will be conducted in such a manner as to mitigate all potential adverse impacts to riparian habitat and aquatic resources at the site. This project will improve fish habitat and reduce the uncertainties of public access in the summer and fall months which will be beneficial to subsistence activities in lower Coal Creek.

### **Water Quality**

Coal Creek and its tributaries drain approximately 84 square miles; the upper Coal Creek drainage is forested on the south slopes and the riparian habitat is largely dense willow stands. Elsewhere in the watershed, low slopes are vegetated with dwarf birch/shrub tundra. An estimated 340 acres in the lower and middle portions of the Coal Creek streambed has been disturbed by mining. Colorado Creek, the major tributary, is lined with white spruce-poplar forest and some mining claims are located here. The benches support moderately open black spruce stands. On the south slope, aspen-birch groves alternate with spruce and spruce dominates the north-facing slopes.

With the exception of mined stream valleys such as Coal Creek, waters of the Preserve are in a natural condition. In Coal Creek, dissolved oxygen, pH, alkalinity, hardness and metal concentrations of the majority of water sampled upstream, within and downstream of mined areas were within EPA (1986) recommended levels for protection of aquatic life. The pH of some headwater-area samples taken were below EPA recommended levels. Relatively high sulfate concentrations (likely from small coal deposits located near the middle and upper reaches) may be limiting to sensitive aquatic invertebrates.

Substantial amounts of stream sediment from mining activity are found in Coal Creek. Recently disturbed areas are extremely unstable and are the major source of sediment, as those areas contain a high percentage of sand and gravel which are carried downstream during periods of high flows. The highest water temperatures encountered were in these areas likely result from increased solar exposure due to stream widening and loss of shading provided in undisturbed areas by streamside vegetation.

For a comprehensive description, see the "Affected Environment" chapter of the Lower Coal Creek /Trail Restoration Draft Environmental Assessment. Other documents contain additional descriptions of the environment of Yukon-Charley Rivers National Preserve:

Yukon-Charley Rivers National Preserve, Final General Management Plan, Land Protection Plan, Alaska Regional Office, National Park Service, 1986.

Final Environmental Impact Statement, Wilderness Recommendation, Alaska Planning Group, 1988.

The National Park Service recognizes that pattern of subsistence use vary from time to time and from place to place depending on the availability of wildlife and other renewable natural resources. A subsistence harvest in a given year may vary considerably from previous years because of weather, migration patterns, and natural population cycles.

## V. SUBSISTENCE USES AND NEEDS EVALUATION

To determine the potential impact on existing subsistence activities, three evaluation criteria were analyzed relative to existing subsistence resources which could be impacted. The evaluation criteria are:

- the potential to reduce important subsistence fish and wildlife populations by (a) reductions in numbers; (b) redistribution of subsistence resources; or (c) habitat losses;
- what affect the action might have on subsistence fisherman or hunter access;
- the potential for the action to increase fisherman or hunter competition for subsistence resources.

### 1) The potential to reduce population:

The middle and lower reaches of Coal Creek have been substantially degraded by sediments from placer mining activities. As a result, fish habitat is relatively poor but known to support low-density populations of Arctic grayling, slimy sculpin, and round whitefish. Diverting the stream flow to its original channel is not expected to have any significant effect on fish inhabiting this portion of the drainage. Wildlife and associated habitats would be subjected to minimal disturbance or impact.

NPS regulations and provisions of ANILCA provide the tools for adequate protection for fish and wildlife populations on Federal Public lands while ensuring a subsistence priority for local rural residents.

### 2) Restriction of Access:

This area is little used for subsistence activities of any kind. If anything, the proposed action could be expected to improve rather than limit or impede access to the upstream portion of the Coal Creek drainage for subsistence non-subsistence users. NPS lands are managed according to legislative mandates, NPS management policies, and guidelines. The proposed action is not anticipated to affect the access of subsistence users to natural resources on NPS lands.

3) Increase in Competition:

Continued implementation of ANILCA subsistence priority provisions would mitigate any increased competition from resource users. No significant impact on subsistence uses is expected under the proposed action.

## VI. AVAILABILITY OF OTHER LANDS

The proposed action is consistent with requirements of ANILCA, National Park Service policies and the Yukon-Charley Rivers National Preserve General Management Plan.

## VII. ALTERNATIVES CONSIDERED

Alternatives considered during this analysis focused on lands within Yukon-Charley Rivers National Preserve.

## VIII. FINDINGS

This analysis concludes that the proposed action would not result in a significant restriction of subsistence uses. Subsistence users utilize other Federal public lands within the region.

### **Appendix B: National Historic Preservation Act (NHPA), Summary of Section 106 XXX Assessment of Effects on Cultural Resources**

The National Park Service has assessed the potential for effects on cultural resources within the Coal Creek Historic Mining District that might result from this diversion project. These site evaluations, consultations with the Alaska State Historic Preservation Officer (SHPO) and XXX forms (Assessment of Actions Having an Effect on Cultural Resources) began in 1998. These documents are on file in the Fairbanks Office for Yukon-Charley Rivers National Preserve.

This type of revetment project at this exact location was assessed for potential effects on cultural resources, including consultation with the SHPO, in XXX YUCH-98-002 in August of 1998. A finding of no effect resulted and the SHPO concurred. No specific stipulations and/or conditions were identified.

An area above the historic camp site was identified in 2001 as a potential gravel borrow site in an earlier project that was to make the upper historic road passable for Ohms was assessed and cleared in XXX YUCH-01-007. The State Historic Preservation Office concurred with the finding of no effect at that

time. The specific stipulations and/or conditions identified in section C (E) of that document addressed upper road corridor issues except #4 that stated:

Borrow/fill material will be taken from the area identified on the attached map and aerial photograph (see figures 1 through 3 above). Material shall be excavated in such a manner as to retain a buffer between the borrow site and Coal Creek Camp. Material shall be removed from the face of the excavation to minimize the appearance of creating a borrow pit.

The SHPO reiterated their concurrence in this assessment in a June 24, 2004 memo to Doug Beckstead, Historian, Yukon-Charley Rivers National Preserve.

In addition, the SHPO reviewed the Army Corps of Engineers section 404 permit for the Coal Creek Stream Diversion (File # 3130-1R COE (POA-2004-945-D) 3130-1R NPS) in a letter dated July 8, 2004. That letter emphasized that the NPS must “take extreme care too insure the proposed stream flow diversion does not create an unnecessary adverse effect” to the Frank Slaven Roadhouse (CHR-089) A National Historic Landmark. The Corps Permit reiterated that concern.

Other gravel sources along the margins of the airstrip where extensive grading occurred during construction and are being assessed and consultation with the SHPO has been initiated. If the SHPO fails to concur that the use of these borrow areas would have no adverse effect on the characteristics that made the District eligible for the National Register of Historic Places, borrow materials would be confined to the previously identified and cleared areas.

## **Appendix C: Floodplains**

Executive Order 11988, Protection of Floodplains, has been considered in this environmental assessment. EO 11988 directs the NPS to restore and preserve natural floodplain values, and to avoid the long and short-term environmental impacts associated with the occupancy and modification of floodplains, and avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In the project are floodplain modification occurred over decades of placer mining in several miles of stream channel. The revetment construction actions described in this EA should serve to restore the natural geometry and function of floodplains below the site, and thus restore and preserve the natural floodplain values. All impacts to floodplains resulting from these actions would be beneficial and in direct support of Executive Orders and NPS policies. Alternative B, the proposed action, does not have the potential to adversely effect the natural resource functions of the floodplain or increase flood risks and is therefore excepted from a floodplain Statement of Finding.

## **Appendix B: Wetlands**

Executive Order 11990, Protection of Wetlands, has been considered in this environmental assessment. EO 11990 directs the NPS to : 1) provide leadership and to take action to minimize the destruction , loss, or degradation of wetlands; 2) to preserve and enhance the natural and beneficial values of wetlands, and 3) to avoid direct or indirect support of new construction in wetlands unless there are no practicable alternatives to such construction and the proposed action includes all practicable measures to minimize harm to wetlands.

In addition to adopting a goal of no net loss of wetlands, the NPS will strive to achieve the longer-term goal of net gain of wetlands. Implementation of the restoration of lower Coal Creek through stream diversion as discussed in this EA, will result in a net gain of wetlands in lower Coal Creek within Yukon-

Charley Rivers National Preserve. Though the stream bank where the revetment structure will be constructed will result in some impact to a short stretch of the bank as identified wetlands, it is expected that the benefit of improved gradient and discharge in the natural channel would far outweigh the minor impacts from construction-related wetlands disturbance. Alternative B, the proposed action, is designed to restore degraded natural stream ecologic and hydrologic processes and is therefore excepted from a Wetlands Statement of Finding by Director's Order 77-1: Wetland Protection Section 4.2 A (e).

## **Tables**

Table 2.1: Summary Impacts of the Alternatives

Table 3.1.1: Estimations for Flood Magnitudes for the Coal Creek Watershed









